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**CANMET**

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

# PYROMETRIC CONE EQUIVALENTS OF FIVE SAMPLES FROM QUEBEC IRON AND TITANIUM CORPORATION, SOREL, P.Q.

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## INTRODUCTION

Québec Iron and Titanium Corporation, Sorel, P.Q., submitted 5 samples of candidate materials for tap-hole refractories, with a request for determination of their Pyrometric Cone Equivalents (PCE's). It was agreed that the tests would be performed in the Ceramic Section at CANMET, on a cost-recovery basis (Job No. 024156). These samples were supplementary to 4 samples tested in December, 1976, none of which met the required specifications (Report MRP/MSL (CF) 76-31 (TR)).

## PROCEDURE

The test procedures followed were those provided in ASTM Designation C24-72, Standard Method of Test for Pyrometric Cone Equivalent (PCE) of Refractory Materials, using the rate of heating provided in Table 2, and standard cones from No. 26 to 35. To avoid possible bloating of the test cones, all were pre-calcined at 975°C (1787°F) prior to testing, as provided in the specification.

## RESULTS

The PCE's of the materials, with estimated temperature equivalents were:

1. QIT Mud Gun Clay (Crushed Firebrick).....Cone $26^{=}$ (≈2905°F)
2. QIT Mud Gun Clay (Calcine clay).....Cone $26^{-}$ (≈2925°F)

3. Bogner Tap Hole Mix.....Cone $26^{+}$ (≈2970°F)
4. Calcine Clay.....Cone $33^{+}$ (≈3185°F)
5. Flint Grain (CRL).....Cone 34 (≈3205°F)

## DISCUSSION

The two "Mud Gun" clays and the "Bogner Top Hole Mix" do not meet QIT's minimum specification of Cone 29 (3018°F). The "Calcine Clay", in combination with the previously tested "Fireclay Sample B", would be expected to produce a tap hole mix exceeding the minimum specification for refractoriness. The "Flint Grain" would be expected to give equal or better results, provided that its composition is compatible with the aluminosilicate based "Fireclay B": this seems likely from the nomenclature and PCE, which would appear to indicate that it is based on flint fireclay.

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